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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,453	10/27/2003	Vladimir I. Gorokhovsky	DSC-P3-US	2518

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EXAMINER
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MCDONALD, RODNEY GLENN

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary****Application No.**

10/694,453

**Applicant(s)**

GOROKHOVSKY, VLADIMIR I.

**Examiner**

Rodney G. McDonald

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/826,940.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/04, 3/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

Claims 6 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 6 and 8 are indefinite because "the evaporator" structure lacks clear antecedent basis.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5, 10, 11, 17 and 22-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buhl (U.S. Pat. 4,929,321) in view of Gorokhovskiy (U.S. Pat. 5,435,900).

Regarding claims 1, 10, 22, 23, Buhl teaches an apparatus and method for application of coatings in vacuum. (See Abstract) Buhl teaches at least one arc source 8' having at least one cathode located within a cathode chamber 7. (Column 5 lines 25-32) At least one anode 20 is present associated with the cathode for generating arc discharge. (Column 5 lines 40-54) The substrate is located off the optical axis of the cathode. (See Fig. 1) At least one deflecting conductor 21 is provided for deflecting the plasma flow. (Column 5 lines 40-54) At least one additional vapor source 8 is disposed

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near a path of the plasma comprised of a material to be evaporated. (Column 5 lines 25-32)

Regarding claims 3, 24, 25, the at least one metal vapor plasma source 8 is located off an optical axis of the substrate. (See Fig. 1)

Regarding claims 5, 10, 22, Buhl suggests utilizing multiple deflector to deflect the flow of the plasma along the upstream and downstream side of the cathodes. (Column 5 lines 59-66)

Regarding claim 11, Buhl teach that the metal vapor plasma source 8 is in opposition to the arc source 8'. (See Fig. 1)

The differences between Buhl and the present claims are the use filtering the arc source (Claims 1, 10), the use of a plasma duct (Claims 1, 10), utilizing of a metal vapor source is not discussed (Claims 1, 10), and the focusing conductors are not discussed (Claims 17, 26).

Regarding the use a filtered arc source (Claims 1, 10), Gorokhovsky teach that diaphragm filters should be mounted in the plasma duct for filtering particles. (Column 4 lines 3-6)

Regarding the use of a plasma duct (Claims 1, 10), Gorokhovsky teach in Fig. 1 utilizing a plasma duct that lead to a coating chamber. (See Fig. 1)

Regarding the use of a metal vapor source (Claim 1, 10), Gorokhovsky teach utilizing titanium as the metal vapor sources. (Column 5 lines 42-43)

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Regarding the use of focusing conductors (Claims 17, 26), Gorokhovsky teach utilizing focusing conductors for guiding the plasma. (Column 3 lines 58-68; Column 4 line 1)

The motivation for filtering the arc source, utilizing a plasma duct, utilizing a metal vapor source and utilizing a focusing conductor is that it allows for applying coatings on large substrates. (Column 3 lines 11-15)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Buhl by filtering the arc source, utilizing a plasma duct, utilizing a metal vapor source and utilizing focusing conductors as taught by Gorokhovsky because it allows for applying coatings on large substrates.

Claims 2, 6, 7, 8, 9, 12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buhl in view of Gorokhovsky as applied to claims 1, 3, 5, 10, 11, 17 and 22-26 above, and further in view of Ehrich (U.S. Pat. 5,662,741).

The differences not yet discussed is the at least one metal vapor plasma source disposed along an optical axis of the substrate holder (Claim 2), the evaporator being disposed between the upstream and the downstream plasma flows (Claim 6), electron beam for evaporating the material (Claims 7, 12), the evaporator being disposed in the upstream plasma flow and the material evaporates under the influence of the plasma flow (Claim 8), disposing at least one metal vapor plasma source in the substrate chamber with the substrate holder is not discussed (Claim 9), the metal vapor plasma source comprising a heated evaporated cathode is not discussed (Claim 14), the metal

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vapor plasma source comprising a heated evaporated anode is not discussed (Claim 15).

Regarding claim 2, Ehrich teach placing at least one metal vapor plasma source along an optical axis of the substrate holder. (See Fig. 1)

Regarding claim 6, Ehrich teach placing at least one evaporator between an upstream (i.e. the plasma flow near the substrate surface) and downstream of the plasma flow (i.e. the plasma near the arc cathode). (See Fig. 1)

Regarding claims 7 and 12, the evaporation source can be an electron beam source. (Column 4 lines 30-37)

Regarding claim 8, Ehrich teach that the evaporator can be placed upstream of the plasma flow and the material evaporates under the influence of the plasma flow. (See Fig. 1; Column 3 lines 15-27)

Regarding claim 9, Ehrich teach that the metal vapor source can be placed in the substrate chamber with the substrate holder. (See Fig. 1)

Regarding claim 14, Ehrich teach that the metal vapor plasma source comprises a heated evaporated cathode. (Column 4 lines 30-37)

Regarding claim 15, Ehrich teach that the metal vapor plasma source comprises a heated anode. (Column 3 lines 15-27)

The motivation for utilizing at least one metal vapor plasma source disposed along an optical axis of the substrate holder, utilizing an evaporator being disposed between the upstream and the downstream plasma flow, utilizing an electron beam for evaporating the material, utilizing an evaporator being disposed in the upstream plasma

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flow and the material evaporating under the influence of the plasma flow, disposing at least one metal vapor plasma source in the substrate chamber with the substrate holder, utilizing a heated evaporated cathode, and utilizing a metal vapor plasma source comprising a heated evaporated anode because it allows for depositing layers at a reduced pressure with high ionization. (Column 1 lines 5-8)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized at least one metal vapor plasma source disposed along an optical axis of the substrate holder, utilized an evaporator being disposed between the upstream and the downstream plasma flow, utilized an electron beam for evaporating the material, utilizing an evaporator being disposed in the upstream plasma flow and the material evaporating under the influence of the plasma flow, disposing at least one metal vapor plasma source in the substrate chamber with the substrate holder, the metal vapor plasma source comprising a heated evaporated cathode, and utilized a metal vapor plasma source comprising a heated evaporated anode as taught by Ehrich because it allows for depositing layers at a reduced pressure with high ionization.

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buhl in view of Gorokhovskiy as applied to claims 1, 3, 5, 10, 11, 17 and 22-26 above, and further in view of Giersch et al. (U.S. Pat. 6,338,778).

The difference not yet discussed is where impulse lasers are used to ignite the arc source. (Claim 19), the grounded deflecting anode and the repelling anode is not discussed (Claim 20).

Regarding claim 19, Giersch et al. teach utilizing a laser in order to ignite the cathode arc source. (Column 2 lines 55-60)

The motivation for utilizing a laser to ignite the cathode arc source is that it allows for ensuring the high operational safety of the cathode arc source. (Column 2 lines 59-60)

Regarding claim 20, Buhl teaches that plural anodes can be utilized to deflect ions. The chamber itself can serve as the grounded electrode. (See Buhl discussed above)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a laser to ignite the arc source as taught by Giersch et al. and to have utilized plural anodes as taught by Buhl because it allows for ensuring operational safety of the cathode arc source and for deflecting ions.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Buhl in view of Gorokhovskiy as applied to claims 1, 3, 5, 10, 11, 17, 19, 20 and 22-26 above, and further in view of Klepper et al. (U.S. Pat. 6,495,002)

The difference not yet discussed is where a nonconductive evaporating material is utilized.

Klepper et al. teach that vacuum arc-deposition can occur from non-metal ceramic or semiconducting electrodes. (Column 1 lines 39-51)

The motivation for utilizing a ceramic cathode is that it allows for depositing a ceramic material. (Klepper et al. Column 1 lines 39-51)



Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a nonconducting cathode for arc deposition as taught by Klepper et al. because it allows for depositing a ceramic material.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-26 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,663,755 in view of Buhl (U.S. Pat. 4,929,321), Gorokhovsky (U.S. Pat. 5,435,900), Ehrich (U.S. Pat. 5,662,741), Giersch et al. (U.S. Pat. 6,338,778) and Klepper et al. (U.S. Pat. 6,495,002).

Claims 1-20 of U.S. Pat. No. 6,663,755 teaches the elements of Applicant's claims.

The differences between claims 1-20 of U.S. pat. 6,663,755 and the present claims is that at least one metal vapor plasma source disposed off an optical axis of the

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substrate is not discussed, the evaporator structures are not discussed, the sputtering means is not taught, the laser ignition means is not discussed, the nonconductive cathode is not discussed and the nonconductive target is not discussed.

Buhl discussed above teach a metal vapor plasma source disposed off the optical axis of the substrate. (See Buhl discussed above)

Gorokhovsky discussed above teach disposed the metal vapor plasma source off the optical axis of the substrate. (See Gorokhovsky discussed above)

Ehrich teach the evaporator structures. The sputtering means are suggested by the Ehrich discussion of using other vapor sources. (See Ehrich discussed above)

Giersch et al. teach utilizing a laser to ignite a cathode. (See Giersch et al. discussed above)

Klepper et al. teach utilizing a non-conductive target. (See Klepper et al. discussed above)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified U.S. Pat. 6,663,755 by utilizing a metal vapor deposition source disposed off the optical axis as taught by Buhl and Gorokhovsky, to have utilized an alternate vapor structure as taught by Ehrich, to have utilized a laser to ignite a cathode and to have utilized a non-conductive target as taught by Klepper et al. because it allows for coating large substrates.

Claims 1-26 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 21-71 of copending Application No. 10/713,529 in view of Buhl (U.S. Pat. 4,929,321),

Gorokhovsky (U.S. Pat. 5,435,900), Ehrich (U.S. Pat. 5,662,741), Giersch et al. (U.S. Pat. 6,338,778) and Klepper et al. (U.S. Pat. 6,495,002).

Claims 21-71 of U.S. Pat. No. 6,663,755 teach the elements of Applicant's claims.

The differences between claims 1-20 of U.S. pat. 6,663,755 and the present claims is that at least one metal vapor plasma source disposed off an optical axis of the substrate is not discussed, the evaporator structures are not discussed, the sputtering means is not taught, the laser ignition means is not discussed, the nonconductive cathode is not discussed and the nonconductive target is not discussed.

Buhl discussed above teach a metal vapor plasma source disposed off the optical axis of the substrate. (See Buhl discussed above)

Gorokhovsky discussed above teach disposed the metal vapor plasma source off the optical axis of the substrate. (See Gorokhovsky discussed above)

Ehrich teach the evaporator structures. The sputtering means are suggested by the Ehrich discussion of using other vapor sources. (See Ehrich discussed above)

Giersch et al. teach utilizing a laser to ignite a cathode. (See Giersch et al. discussed above)

Klepper et al. teach utilizing a non-conductive target. (See Klepper et al. discussed above)

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified U.S. Pat. 6,663,755 by utilizing a metal vapor deposition source disposed off the optical axis as taught by Buhl and

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Gorokhovsky, to have utilized an alternate vapor structure as taught by Ehrich, to have utilized a laser to ignite a cathode and to have utilized a non-conductive target as taught by Klepper et al. because it allows for coating large substrates.

This is a provisional obviousness-type double patenting rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Rodney G. McDonald  
Primary Examiner  
Art Unit 1753

RM  
October 13, 2005